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## POTATOES FOR LIVESTOCK

Normally potatoes are not considered to be a standard feed for livestock. When crops are abundant and markets limited, low grade market stock, small and cull potatoes may be disposed of profitably as livestock feed. Farmers and growers having a surplus of potatoes would be well advised to study the feasibility of marketing a portion of their crop through farm animals.

Analysis shows that potatoes contain approximately twice as much dry matter and total digestible nutrients as do common root crops such as mangels and turnips, and that they are about equal to corn silage in dry matter and total digestible nutrients. They are, however, practically free of fibre and should therefore be considered to be a watery concentrate rather than a succulent roughage. Potatoes are low in protein and this protein is not particularly well



Potatoes being fed to hogs.

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utilized by livestock. Because of this, a ration containing potatoes must be balanced by the inclusion of some protein-rich feed. The vitamin content of potatoes is almost negligible. In the case of cattle and sheep, however, the feeding of well cured mixed or legume hay will overcome this deficiency. Normally when raw potatoes can be obtained for approximately one-sixth to one-quarter the cost of barley, they are an economical and satisfactory feed if fed in a balanced ration and if certain precautions are observed.

### Methods of Feeding

*Raw.*—Raw potatoes are most suitable as a feed for cattle and sheep, and require no preparation except that they should be sliced or chopped in order to eliminate the possibility of losses among the stock due to choking. Excess dirt on the potatoes should be removed before chopping. Unripe potatoes and potato sprouts contain small amounts of a poison, solanin, and should not be used for feed. As potatoes are not too palatable to stock, the rate of feeding must be increased gradually as the animals become accustomed to this unusual feed. Feeding too large quantities of raw potatoes will sometimes cause scouring; if this happens the amount fed should be reduced promptly.

*Cooked.*—Potatoes may be cooked by either boiling or steaming and in this form are particularly suitable as a feed for swine. One method of cooking potatoes is to steam them in molasses barrels or puncheons. If boiled, the water in which they were boiled should be discarded. In order to increase the palatability a little salt should be added to the potatoes during cooking. It is important that the cooking be sufficiently thorough to break down the cells.

*Potato Silage.*—Since one problem in connection with a potato surplus is that the entire crop is harvested at one time and consequently must be stored in order to make full use of it for livestock feeding, various methods of preservation have been tried. One of the most successful of these is to preserve the surplus crop as potato silage.

*Dried.*—Another method of preserving surplus potatoes is to have them dried. This process has the advantage that it greatly reduces bulk and weight for storage or shipment.

Dried potatoes may be fed soaked or they may be ground and then mixed with the meal mixture. However, the cost of dehydration is usually such as to prohibit their use for commercial livestock feeding.

### Classes of Stock

*Dairy Cattle.*—In an experiment conducted by the Dominion Experimental Station, Fredericton, N.B., two lots of dairy cows were each fed the same ration except that one lot received forty pounds of pulped mangels per head per day and the other lot received twenty pounds of pulped potatoes daily. There was no evidence of scouring and all animals came through the test in good condition. The results indicated that when potatoes are fed at this rate they can satisfactorily replace mangels in a ration for dairy cows. When raw potatoes are fed to milking cows they should be given immediately after milking since the milk will readily become tainted if exposed to an atmosphere heavy with potato odour.

*Beef Cattle.*—Working with beef cattle, the Central Experimental Farm, Ottawa, found that for fattening steers with a hay-grain-silage ration the silage can be successfully replaced by either raw potatoes or dried potatoes soaked before feeding, or forty per cent of the meal mixture can be replaced by ground dried potatoes. In this experiment no significant difference was found between the various lots in rate of gain, gain/feed ratio or carcass quality. While the dried potatoes caused no difficulty, care had to be taken in feeding the raw potatoes in order to avoid digestive disturbances such as scouring. It was found

that twenty to twenty-five pounds of raw potatoes per head per day is the safe upper limit for steers weighing approximately one thousand pounds. In this experiment one hundred pounds of raw potatoes proved to be equal in feeding value to fourteen pounds of barley and one hundred pounds of ground dried potatoes had the same value as one hundred and twenty-five pounds of barley. Dried potatoes when soaked and used to replace corn silage dropped in value to eighty-eight per cent of that of barley. As with dairy cattle raw potatoes must be sliced or chopped for beef cattle.

*Swine.*—In a series of trials with bacon hogs the Experimental Farms Service has found that raw potatoes lowered the rate of gain slightly and increased the amount of feed required per hundred pounds of gain. When the potatoes were cooked, rate of gain and feed/gain ratios were normal. However, the economy of cooking potatoes for swine will of course depend directly upon the cost of such a procedure. Other potato products such as dried potatoes and potato silage gave satisfactory results. In no case did the feeding of potatoes or potato products prove detrimental to carcass quality. In summarizing all trials with bacon hogs one hundred pounds of raw potatoes were equivalent in feeding value to seventeen pounds of barley while one hundred pounds of raw potatoes, cooked, were equal to twenty-two pounds of barley. The values obtained for one hundred pounds of raw potato silage, cooked potato silage and dried potatoes were twenty-six, thirty-eight and seventy-seven pounds of barley respectively. In all cases these products were fed in a balanced ration. In general it may be said that bacon hogs can safely be fed up to the equivalent of six pounds of raw potatoes per head per day while brood sows can be given approximately double this amount.

*Horses.*—While little experimental work has been done with this class of stock it is reported that raw potatoes can be fed at the rate of fifteen to twenty pounds per head daily. This applies particularly to idle horses and those on light work.

*Lambs.*—Trials carried out in the United States indicate that the addition of raw potatoes to a hay-grain ration for fattening lambs increased the average rate of gain somewhat. When fed to this class of stock they are normally fed at a rate of up to one or two pounds per head per day. Here again the potatoes should be pulped or chopped.

### **Suggested Rations Including Potatoes**

The following are suggested rations for various classes of stock. In all of these rations various substitutions may be made but the rations will serve as a guide to those who have surplus potatoes that are to be utilized as a feed for livestock. All figures given are the amount to be fed to each animal daily. With all these rations; salt and a mineral mixture should be available to the stock at all times.

*Dairy Cattle.*—For milking cows the following rules should be followed if potatoes are fed.

- (a) Feed one and one-half pounds of good quality legume or mixed hay for each one hundred pounds liveweight.
- (b) Feed two pounds of chopped raw potatoes for each one hundred pounds liveweight up to a maximum of twenty pounds of potatoes.
- (c) Feed one pound of meal mixture for each three to four pounds of milk produced daily. Cows giving milk rich in butterfat require more meal in proportion to the pounds of milk than do cows giving milk of a lower butterfat percentage.

A suitable meal mixture to feed with potatoes would be:

Ground oats .....	400 pounds	Wheat bran .....	200 pounds
Ground barley .....	300 pounds	Linseed oilmeal .....	100 pounds

*Beef Cattle.*—The following ration is suitable for fattening long yearlings weighing approximately nine hundred pounds at the start of the period and eleven hundred pounds when finished.

Mixed hay .....	8 pounds
Grain mixture .....	7 pounds
Chopped raw potatoes .....	22 pounds

A suitable grain mixture would be:

Barley .....	400 pounds	Bran .....	100 pounds
Oats .....	200 pounds	Linseed oilmeal .....	100 pounds

The above figures represent the average rate for the entire feeding period. When the animals are first put on feed the amount of hay would be higher and the rate of grain and potato feeding proportionately lower, as the period advanced these ratios would gradually alter.

When fed to beef animals, cows or young stock, being over-wintered, potatoes can replace up to twenty pounds of the silage per head per day. If no silage is being fed potatoes will replace hay at the rate of two to two and one-half pounds of potatoes per pound of hay depending on the quality of the hay. Once again not more than twenty pounds per head should be fed.

*Swine.*—When potatoes are used as a feed for swine a general rule is to replace one pound of the meal mixture with four pounds of raw potatoes, which are cooked, and fed up to a maximum of six pounds for bacon hogs and up to twelve pounds for brood sows.

For pigs weighing one hundred pounds feed four pounds of the meal mixture plus four pounds of raw potatoes, cooked.

A suitable meal mixture would be:

Grounds oats .....	150 pounds
Ground barley .....	100 pounds
Wheat shorts or middlings .....	100 pounds
Hog protein-mineral supplement .....	50 pounds

For bacon hogs in the finishing stage (125-200 pounds) the proportion of oats can be decreased and the barley increased, and larger amounts of both grain and potatoes fed, but in the same proportions.

*Horses.*—This ration is suitable for horses on light to medium work weighing about twelve hundred pounds.

Timothy or grass hay ..	14 pounds	Linseed oilmeal .....	1 pound
Oats .....	5 pounds	Chopped raw potatoes ..	16 pounds

With idle horses and young stock less grain need be fed.

*Fattening lambs.*—The following ration is suitable for lambs that average about seventy pounds when put on feed.

High quality alfalfa or other legume hay .....	1.5 pounds
Grain mixture .....	1 pound
Chopped raw potatoes .....	2 pounds

A suitable grain mixture would be:

Oats .....	450 pounds
Barley .....	100 pounds
Linseed oilmeal .....	100 pounds

In the fattening rations the figures given represent the average for the entire feeding period. When first put on feed the animals should be given more hay and less grain and potatoes, as the period advances these proportions can be altered. In the meal mixture for lambs the proportion of oats should be higher at the start of feeding and proportionately lower as the animals approach the end of the feeding period.

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